

CLAIMS

1. The method of determining the existence of and identifying any one of a plurality of 2^N-1 bioagents in a sample containing a bioagent, where N is an integer greater than 1, comprising the steps of:

dividing the sample into N parts; and

performing a separate detection process on each of the N parts of the sample to define a plurality of N detection processes, said detection process employing molecular interactions to uniquely identify bioagents, each of said separate detection processes of said plurality possessing a capability to detect a bioagent from a collection of known bioagents, said collection of known bioagents of any one of said separate detection processes in said plurality being different from the collection of known bioagents detectable by any other of said separate detection processes in said plurality, wherein the collective result of said plurality of N detection processes identifies an individual one of said plurality of 2^N-1 bioagents.

2. The method of determining the existence of and identifying any one of a plurality of 2^N-1 bioagents in a sample containing a bioagent, wherein said step of performing a separate detection process on each of said N parts to define a plurality of N detection processes comprises the step of performing said plurality of N detection processes concurrently.

3. The method of determining the existence of and identifying any one of a plurality of 2^N-1 bioagents in a sample containing a bioagent as defined in claim 2, wherein each of said plurality of N detection processes comprises an enzyme linked immunoassay ("ELISA") process.

4. The method of determining the existence of and identifying any one of a plurality of 2^N-1 bioagents in a sample containing a bioagent as defined in claim 3, wherein said integer is 2.

5. The method of determining the existence of and identifying any one of a plurality of $2^N - 1$ bioagents in a sample containing a bioagent as defined in claim 3, wherein said integer is 3.
6. The method of determining the existence of and identifying any one of a plurality of $2^N - 1$ bioagents in a sample containing a bioagent as defined in claim 3, wherein said integer is 4.
7. The method of determining the existence of and identifying any one of a plurality of $2^N - 1$ bioagents in a sample containing a bioagent as defined in claim 3, wherein said integer is 5.
8. The method of determining the existence of and identifying any one of a plurality of $2^N - 1$ bioagents in a sample containing a bioagent as defined in claim 1, wherein said step of performing said separate identification process on each of said N parts includes the steps of:
- coating beads in N different collections and coating each collection of beads in said N different collections with receptor molecules for less than $2^N - 1$ multiple bioagents but in which said N different collections contain collectively receptor molecules for all of said $2^N - 1$ multiple bioagents, with one of said receptor molecules in each collection being a receptor for the same bioagent, and with another of said receptor molecules in each collection being unique amongst the receptor molecules of all other collections; and
- applying each collection of coated beads in a respective one of said separate identification processes.
9. The method of determining the existence of and identifying any one of a plurality of $2^N - 1$ bioagents in a sample containing a bioagent as defined in claim 3, wherein said step of performing said separate ELISA process on each of said N parts includes the steps of:

coating beads in N different collections and coating each collection of beads in said N different collections with receptor molecules for less than $2^N - 1$ multiple bioagents but in which said N different collections contain collectively receptor molecules for all of said $2^N - 1$ multiple bioagents, with one of said receptor molecules in each collection being a receptor for the same bioagent, and with another of said receptor molecules in each collection being unique amongst the receptor molecules of all other collections; and

applying each collection of coated beads in a respective one of said separate ELISA processes.

10. The method of determining the existence of and identifying any one of a plurality of $2^N - 1$ bioagents in a sample containing a bioagent as defined in claim 9, wherein said step of coating each collection of beads in said N different collections with receptor molecules for less than $2^N - 1$ multiple bioagents, includes the step of:

coating individual groups of beads with receptor molecules for individual bioagents of said collection and mixing said groups together to form a collection of beads containing receptor molecules for the bioagents in said collection.

11. The method of determining the existence of and identifying any one of a plurality of $2^N - 1$ bioagents in a sample containing a bioagent as defined in claim 9, wherein said step of coating each collection of beads in said N different collections with receptor molecules for less than $2^N - 1$ multiple bioagents, includes the step of:

coating beads with receptor molecules for the bioagents of said collection.

12. The method of determining the existence of and identifying any one of a plurality of $2^N - 1$ bioagents in a sample containing a bioagent as defined in claim 9, includes the step of:

compounding a conjugate solution for said ELISA process in which said conjugate solution contains 2^o Ab-Enz molecules for at least each of the bioagents in said collection.

13. The method of determining the existence of and identifying any one of a plurality of 2^N-1 bioagents in a sample containing a bioagent as defined in claim 1 further comprising the step of comparing the results of the tests with a chart, said chart correlating the test results of the N detection processes to specific bioagents, and determining the bioagent identified by said chart.

14. A method of testing for bioagents, comprising:

dividing a sample into at least N portions; and

performing a plurality of N tests for bioagents concurrently on respective portions of said sample to determine the existence of any one of a plurality of 2^N-1 bioagents in said sample, where N is an integer greater than 1.

15. The method of determining the existence of and identifying any one of a plurality of 2^N-1 bioagents in a sample containing a bioagent, where N is a number selected from the series of integers comprising 2, 3, 4, 5....x, comprising the steps of:

dividing the sample into N parts; and

performing a separate enzyme linked immunoassay ("ELISA") process on each of the N parts, concurrently to detect if said bioagent is one that is within a collection of bioagents that the respective ELISA process is able to detect, each of said separate ELISA processes possessing the capability of detecting a bioagent from amongst a unique collection of bioagents, said collection of possible bioagents identifiable by any one of said separate ELISA processes being different from the collection of possible bioagents identifiable by any other of said separate ELISA processes, wherein the collective result of said

identification process of all of said N parts identifies an individual one of said plurality of $2^N - 1$ bioagents;

 said step of performing a separate enzyme linked immunoassay ("ELISA") process on each of the N parts, including the steps of:

 coating beads in N different groups and coating each group of beads in said N different groups with receptor molecules for less than $2^N - 1$ multiple bioagents but in which said N groups collectively contain receptor molecules for all of said $2^N - 1$ multiple bioagents, with one of said receptor molecules in each group being a receptor for the same bioagent, and with another of said receptor molecules in each group being unique amongst the receptor molecules of all other groups;

 coating individual groups of beads with receptor molecules for individual bioagents of said collection and mixing said groups together to form a collection of beads containing receptor molecules for the bioagents in said collection;

 compounding a conjugate solution for said ELISA process in which said conjugate solution contains 2° Ab-Enz molecules for at least each of the bioagents in said collection; and

 applying each group of coated beads in a respective one of said ELISA detection processes.